Clearwater National Forest
Watershed and Fisheries Monitoring Plan
1996

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To: Dallas Emch, Ecosystem Management Program Officer

The attached document represents the Forest's first attempt to summarize the annual aquatic monitoring projects that are scheduled within the watershed and fisheries program areas. This report outlines the monitoring activities that the districts and supervisor's office will conduct via internal workforce, contract or cooperation with other federal, state or tribal entities.

Since 1990, the Forest Hydrologist and Forest Soil Scientist with assistance from other SO and district hydrological and biological personnel have completed an annual Soil and Water Monitoring Report. This report included water quality monitoring, BMP monitoring (harvest units and roads) and some monitoring of instream variables (substrate etc). The soils portion of the plan was removed following the retirement of Dale Wilson; we anticipate that information on soils and road BMP reviews will be included in the 1997 monitoring plan.

While the watershed program administered the water quality aspect of the aquatic monitoring, the majority of the monitoring of instream variables (substrate and riparian conditions, fisheries rearing and spawning conditions) were collected by the forest fisheries program via stream surveys and various monitoring projects. Most of these ongoing fisheries and watershed monitoring projects complement or supplement each other. Therefore the combination of the monitoring activities into one report would allow for more efficient coordination internally as well as provide the public and other federal, state and tribal entities one document outlining the entire aquatic monitoring program for the Forest.

The 1996 plan also includes information where the Timber Sale Unit BMP Audit and the PACFISH and INFISH implementation and effectiveness monitoring reviews will be conducted on the Forest. Jim Mital assisted us in the selection of the timber sale units for the BMP audit; Jim will assist us and the districts in the BMP audit as well as the PACFISH/INFISH reviews. Two other members of the PACFISH/INFISH ID team, Byron Bonney (Fire) and Bill Wulf (Silviculture) are also anticipated in assisting with some of the reviews. The schedules for these reviews will be finalized this summer; the initial plans are to conduct the audit and reviews during late August through early October.

The results of each monitoring project included in this plan will be documented via specific project reports, brief summaries and/or in the Forest's Annual Monitoring and Evaluation Report.

We would appreciate any comments on the format and/or content of this plan. Our goal is to fine-tune this document for fiscal year 1997 to provide a comprehensive aquatic monitoring plan for the Clearwater National Forest.

PATRICK K. MURPHY
Forest Fisheries Biologist

RICHARD M. JONES
Forest Hydrologist

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Overview

This document is a compilation of fiscal year 1996 monitoring projects concerning the water and fisheries resources of the Clearwater National Forest. The primary goal of the water quality monitoring program is to determine if land management activities implemented are meeting Forest Plan standards and objectives. The format of this plan is that agreed to by the Northern and Intermountain Regions of the Forest Service and the Idaho Department of Health and Welfare.

The Forest has divided the monitoring strategy into two major areas; **on-site** and **instream** monitoring. On-site monitoring includes baseline, implementation, and Best Management Practice (BMP) effectiveness monitoring. Instream monitoring addresses the relations between land disturbing activities and water quality, and includes baseline, effectiveness, and validation monitoring. Monitoring in this plan is categorized into baseline, implementation, effectiveness, and validation. Each is described in detail.

Baseline

Baseline monitoring characterizes existing water quality conditions and long-term trends of stream systems. It also provides a control for assessing the effects of activities. Baseline monitoring sites were established to represent conditions on the Forest. Each site is intended to fulfill one or both of two primary objectives: 1) Identify long-term trends and variability; and 2) Provide reference sites (or controls). Long-term sites provide information on the natural process, functions, and variability of streams and watershed systems over time. Many sites will also provide a control or basis to compare watersheds with similar climatic, physical, and hydrologic characteristics.

Baseline monitoring data on the Forest's streams is also collected by other federal, state and Tribal agencies. In most cases, the monitoring conducted by these entities are geared to specific research or management type projects; the Forest coordinates annually with these entities to avoid duplication of monitoring efforts and supplement the Forest monitoring program. Climatic stations, snow courses, and stream gages operated by the National Oceanic and Atmospheric Administration, Soil Conservation Service, and the Geological Survey complement the Forest's baseline network. Fish population monitoring stations conducted by the Idaho Department of Fish and Game and the Nez Perce Tribe also supplements the baseline information on Forest streams. Monitoring information collected by the Idaho Division of Environmental Quality (DEQ) using the procedures outlined in the Beneficial Use Reconnaissance Project (BURP) for various streams throughout the Forest will also supplement the baseline monitoring data base.

Implementation

Implementation monitoring documents whether prescribed practices were implemented as designed and in accordance with Forest Plan standards. In 1995, the Forest Plan was revised by PACFISH and INFISH strategies. Direction included (1) set management riparian goals and riparian management objectives, (2) established riparian habitat conservation areas (RHCA's) and (3) applied standards and guidelines to RHCA's to meet the riparian management objectives.

During past years, the primary activities monitored for implementation monitoring included road construction and timber harvest operations. As in past years, evaluation of implementation monitoring results will be used to show compliance with the Idaho Forest Practices Act and fine-tune project plans to improve on-the-ground BMP implementation. Although the majority of the implementation monitoring will focus on road construction and timber harvest in 1996, other activities, such as, mining, grazing, recreational, fire suppression and watershed rehabilitation will be included; the monitoring will center on PACFISH and INFISH compliance.

Contract and project administration constitutes ongoing implementation monitoring on developmental projects. This monitoring is done by timber sale administrators, engineering representatives, and contracting officers. Documentation is brief and is maintained in the project file.

Supplemental implementation monitoring will include field reviews by the Forest Hydrologist and Forest Fisheries Biologist. Ten percent of harvest units and the roads located therein will be evaluated each year. The primary objective will be to determine if BMPs identified in the project plans are implemented and correctly applied in a timely fashion. During the review, visual observations will be made to see if BMPs and Forest/Project plan standards are effective. In addition to the ten percent of the harvest units selected for BMP compliance, additional harvest units have been selected for PACFISH/INFISH monitoring.

In the event of incorrect or inappropriate application of BMPs, or omission of prescribed BMPs, causes will be identified along with corrective or preventive actions. The inappropriate application or omission will be documented in a letter to the District Ranger with suggested methods to implement the specific BMP.

Effectiveness

Effectiveness monitoring shows if BMPs and project objectives are effective in controlling pollutants to planned levels or resource management objectives. They also determine if beneficial uses are protected. The intent is to focus on cause and effect relationships between land management activities and water quality. Effectiveness monitoring will be done mainly as a demonstration of project plan activities and BMP effectiveness. Effectiveness monitoring will be quantitative and use the least complicated measurements.

Effectiveness monitoring will usually be done on a sample basis to characterize typical conditions so that results can be extrapolated. Emphasis will be on major nonpoint source contributing activities, such as road construction, reconstruction, and maintenance, timber harvesting, and riparian area management.

Effectiveness monitoring results will be interpreted in terms of Idaho State water quality standards and Forest Plan standards and objectives; this includes assessing effectiveness regarding PACFISH and INFISH strategies. The data collected will document land management effects on beneficial uses of the stream. Results may suggest the need to modify BMPs, Forest Plan standards, or State water quality standards, and may result in an amendment to the Forest Plan. This monitoring will satisfy the nonpoint source feedback loop policy of both the Forest Service and State of Idaho.

Validation

Validation monitoring evaluates whether coefficients, models, and Forest Plan standards are valid to meet policy, laws, and regulations. Validation monitoring requires a long-term commitment and intensive data collection at established permanent stations.

Each monitoring activity will include the following: 1) Type of monitoring; 2) Project name; 3) Site location; 4) Objectives; 5) Parameters; 6) Frequency; 7) Duration; 8) Methodology; 9) Data Storage; 10) Reporting; 11) Personnel needed; and 12) Responsible individual(s).

Water Quality Limited Segments

Extensive monitoring is currently being done in Water Quality Limited Segment (WQLS) streams. The following table summarizes fiscal year 1996 watershed and fisheries monitoring in each WQLS stream.

Monitoring Activities in Water Quality Limited Segment Streams

Basin	Stream Name	District	Page Reference
Palouse	Palouse River	Palouse	12, 16, 22, 28, 40
Palouse	Deep Creek	Palouse	

Basin	Stream Name	District	Page Reference
Palouse	Gold Creek	Palouse	39, 58
Palouse	Jerome Creek	Palouse	
Palouse	Big Creek	Palouse	40
Palouse	Meadow Creek	Palouse	28
Palouse	Blakes Fork	Palouse	40
Palouse	E.F. Meadow Creek	Palouse	
Palouse	Mannering Creek	Palouse	
Palouse	Wepah Creek	Palouse	
Palouse	Strychnine Creek	Palouse	
Palouse	Dry Fork	Palouse	
Palouse	N.F. Palouse River	Palouse	40
Palouse	Big Sand Creek	Palouse	40
Palouse	Little Sand Creek	Palouse	
Palouse	Bonami Creek	Palouse	
Potlatch	Potlatch River	Palouse	15, 22, 28
Potlatch	Corral Creek	Palouse	15
Potlatch	W.F. Potlatch River	Palouse	15, 28
Potlatch	Feather Creek	Palouse	28
Potlatch	Moose Creek	Palouse	
Potlatch	Porcupine Creek	Palouse	
Potlatch	E.F. Potlatch River	Palouse	
Potlatch	Ruby Creek	Palouse	
North Fork	Elk Creek	Palouse	24, 28, 40, 58
North Fork	Long Meadow Creek	Palouse	
North Fork	Partridge Creek	Palouse	

Basin	Stream Name	District	Page Reference
North Fork	Johnson Creek	Palouse	
North Fork	W.F. Elk Creek	Palouse	40, 58
North Fork	Cranberry Creek	Palouse	
North Fork	Swamp Creek	Palouse	
North Fork	Orogrande Creek	Pierce	32, 41
North Fork	Sylvan Creek	Pierce	32
North Fork	Hem Creek	Pierce	32
North Fork	Tamarack Creek	Pierce	
North Fork	Pine Creek	Pierce	32
North Fork	Middle Creek	Pierce	32
North Fork	Cougar Creek	North Fork	13, 19, 29
North Fork	Grizzly Creek	North Fork	29
North Fork	Cold Springs Creek	North Fork	29
North Fork	Cool Creek	North Fork	29
North Fork	Deception Creek	North Fork	
North Fork	Osier Creek	North Fork	30
North Fork	China Creek	North Fork	30
North Fork	Laundry Creek	North Fork	31
North Fork	Swamp Creek	North Fork	
North Fork	Sugar Creek	North Fork	
North Fork	Tumble Creek	North Fork	
North Fork	Sneak Creek	North Fork	31
North Fork	Isabella Creek	North Fork	21, 31
North Fork	Dog Creek	North Fork	
North Fork	Beaver Creek	North Fork	

Basin	Stream Name	District	Page Reference
North Fork	S.F. Beaver Creek	North Fork	
North Fork	Bingo Creek	North Fork	
North Fork	Bertha Creek	North Fork	
North Fork	Sourdough Creek	North Fork	
North Fork	Gravey Creek	Powell	42
North Fork	Marten Creek	Powell	
Lolo	Lolo Creek	Pierce	22, 33, 43, 50, 53, 56
Lolo	Yoosa	Pierce	13, 17, 50, 53
Lolo	Camp Creek	Pierce	33
Lolo	Chamook Creek	Pierce	
Lolo	Musselshell Creek	Pierce	13, 17, 33, 53,
Lolo	Eldorado Creek	Pierce	17, 22, 33, 43, 50, 53, 56
Lolo	Dollar Creek	Pierce	
Lolo	Cedar Creek	Pierce	34
Lolo	Mud Creek	Pierce	33
Lolo	Yakus Creek	Pierce	33
Lochsa	Lochsa River	Lochsa and Powell	18, 21, 34, 43
Lochsa	Pete King Creek	Lochsa	18, 22, 26, 34, 50, 56
Lochsa	W.F. Pete King Creek	Lochsa	34
Lochsa	Walde Creek	Lochsa	34
Lochsa	Placer Creek	Lochsa	34
Lochsa	Nut Creek	Lochsa	34
Lochsa	Canyon Creek	Lochsa	18, 22, 34
Lochsa	S.F. Canyon	Lochsa	35
Lochsa	Mystery Creek	Lochsa	18, 35

Basin	Stream Name	District	Page Reference
Lochsa	Glade Creek	Lochsa	35
Lochsa	Deadman Creek	Lochsa	22, 35, 45, 50, 56, 62
Lochsa	W.F. Deadman Creek	Lochsa	35, 45, 62
Lochsa	Post Office Creek	Powell	36, 47, 50, 56
Lochsa	Squaw Creek	Powell	18, 23, 36, 47, 50, 51, 53, 54, 56
Lochsa	Doe Creek	Powell	36, 47
Lochsa	Badger Creek	Powell	
Lochsa	Papoose Creek	Powell	21, 36, 48, 50, 51, 54, 56
Lochsa	Parachute Creek	Powell	37, 48
Lochsa	Crooked Fork	Powell	21, 37, 48, 54
Lochsa	Shotgun Creek	Powell	37, 47, 65
Lochsa	Boulder Creek	Powell	47, 65
Lochsa	Spruce Creek	Powell	
Lochsa	Shoot Creek	Powell	
Lochsa	Walton Creek	Powell	23, 26, 38

On-Site Monitoring

Monitoring Project Summary Sheet

Type of Monitoring: Baseline

Project Name: Forest-Wide Precipitation Gages

District	Station	Township	Range	Section	Gage Type	Period of Record
North Fork	Beaver	39N	5E	23	1	1969-Current
North Fork	Cayuse	38N	11E	3	2	1967-Present
North Fork	Doris	37N	9E	6	3	1966-Present
North Fork	Indian Henry	41N	9E	26	2	1996
Lochsa	Walde	34N	7E	31	2	1966-Present

Gage Type: 1 = 100" Sacramento, Non-Recording Gage
2 = 200" Sacramento, Non-Recording Gage
3 = Standpipe

Objectives: To update and modify the Forest's precipitation maps.

Parameters: Annual precipitation.

Frequency: Annually.

Duration: Indefinitely.

Methodology: Gages will be drained and the total catch measured at the end of the water year (September 30). The gages will be recharged with oil and anti-freeze for the next year.

Data Storage: S.O. Watershed files.

Report: As needed.

Cost: $500 Annually.

Personnel Needed: One or two.

Responsible Individual: Dick Jones

Monitoring Project Summary Sheet

Type of Monitoring: Baseline

Project Name: Forest-Wide Snow Survey

District	Station	Township	Range	Section	Gage Type
Pierce	Pierce R.S.	36N	5E	2	Snow Course
Powell	Crooked Fork	37N	14E	27	Snow Course
Powell	Savage Pass	36N	15E	18	SNOTEL, Precipitation
Powell	Lolo Pass	38N	15E	11	SNOTEL, Precipitation

Objectives: Cooperative snow survey with the Soil Conservation Service. The survey determines the yearly snowpack for water availability in the Columbia Basin watershed for hydropower, irrigation, and recreation users.

Parameters: Snow depth, water content, snowpack density, minimum and maximum temperatures, and annual precipitation.

Frequency: As found in the *Idaho Snow Survey Measurement Schedule.*

Duration: Indefinitely.

Methodology: Standard SCS snow survey techniques.

Data Storage: SCS and District files.

Report: The SCS develops monthly and annual reports of all snow courses in Idaho. Dick Jones develops a report every two weeks of current snowpack water content.

Cost: $2,000 Annually.

Personnel Needed: Clare Brick, Pierce R.D. and Jed Simon, Powell R.D. and one other person from each District.

Responsible Individual: Clare Brick, Pierce R.D. and Jed Simon, Powell R.D.

Monitoring Project Summary Sheet

Type of Monitoring:	Implementation
District:	All Districts
Project Name:	Timber Sale Contract and Idaho Forest Practices Act Compliance Monitoring.
Site Location:	All ongoing timber sales.
Objectives:	Determine compliance with timber sale contract specifications and Idaho Forest Practices Act Rules and Regulations. Also determine if PACFISH or INFISH RHCA's (site specific or default riparian buffers) are being implemented. Correct non-compliance to eliminate potential water quality problems.
Parameters:	Streamside protection (RHCA's), culverts, grass seeding, erosion control on roads, skid trails, and landings.
Frequency:	Continuously. As sales are administered.
Duration:	Indefinitely.
Methodology:	Visual inspections by sale administrators.
Data Storage:	District timber sale package.
Report:	In timber sale package.
Personnel Needed:	All sale administrators.
Responsible Individual:	District Rangers.

Monitoring Project Summary Sheet

Type of Monitoring:	Implementation and Effectiveness.
District:	All Districts
Project Name:	Timber Sale Unit BMP Audit.

Site Location: Selected timber sales.

Objectives: Determine BMP implementation and effectiveness in preventing sediment delivery to Class I and Class II streams. Determine if BMPs meet or exceed the Idaho FPA Rules and Regulations.

Parameters: Inspection of Idaho FPA Rules and Regulations implementation and effectiveness in timber sale units, including timber harvest, site preparation, and skid trail location and design.

Frequency: One site visit of a timber sale unit during or after logging, or during or after site preparation.

Duration: One site visit.

Methodology: A visual inspection of 10% of all timber sale units by an S.O. and District interdisciplinary team. Representatives from IDL and DEQ will be invited to the audit.

Data Storage: S.O. Watershed files.

Report: Dick Jones will write an annual summary for the *Forest Plan Monitoring Results Report.*

Cost: $1500

Personnel Needed: Dick Jones and Pat Murphy with assistance from S.O. and District representatives.

Responsible Individual: Dick Jones

Sampling Site: Potlatch River Drainage:

District	Timber Sale	Harvest Unit	Project Status[1]
Palouse	Upper Palouse	8	I
Palouse	Upper Palouse	9	I

[1] C - Completed; I - Ongoing; P - Proposed

Sampling Site: Orofino Creek Drainage:

District	Timber Sale	Harvest Unit	Project Status[1]
Pierce	Jenson Creek	2	I

[1] C - Completed; I - Ongoing; P - Proposed

Sampling Site: Lolo Creek Drainage:

District	Timber Sale	Harvest Unit	Project Status[1]
Pierce	Lolo Yoosa	9	I
Pierce	Greer Nelson	11	I

[1] C - Completed; I - Ongoing; P - Proposed

Sampling Site: Lochsa River Drainage:

District	Timber Sale	Harvest Unit	Project Status[1]
Lochsa	Cabin Patch	2	I
Powell	Brushy Creek	26	I
Powell	Brushy Creek	27	I

[1] C - Completed; I - Ongoing; P - Proposed

Sampling Site: North Fork Clearwater River Drainage:

District	Timber Sale	Harvest Unit	Project Status[1]
North Fork	Cougar	4	I
North Fork	Cougar	10	I

[1] C - Completed; I - Ongoing; P - Proposed

Monitoring Project Summary Sheet

Type of Monitoring:	Implementation and Effectiveness.
District:	All Districts
Project Name:	PACFISH and INFISH compliance monitoring.
Site Location:	Selected activities (timber harvest units, roads, mining, grazing, recreational, fire suppression and watershed rehabilitation) throughout the Forest.
Objectives:	Determine implementation and effectiveness of PACFISH or INFISH standards and guidelines in the selected watersheds. Determine if site specific and/or default RHCA's and other applied standards and guidelines are not impeding the attainment of the riparian management goals and objectives as set forth in the PACFISH and INFISH strategies within the Forest Plan.
Parameters:	Inspection of RHCA's within the project area. The size of the RHCA's, the level of activity permitted within the RHCA's and the subsequent changes to stream shade, potential woody debris and sedimentation are the major variables to be assess in the field.
Frequency:	One site visit of a completed activity. In some cases, reviews may be annually (mining, grazing activities) or extend over several years until the project is completed (timber sale unit during or after logging, or during or after site preparation). In most cases, the review will be conducted after the project is completed; the reviews will be contingent upon the project implementation schedule during 1996.
Duration:	One site visit in 1996; unless conditions warrant follow-up visits in 1996 and/or future years.
Methodology:	A visual inspection timber harvest units selected for the Timber Sale Unit BMP Audit and other activities (including additional timber harvest units) selected during the 1995 PACFISH and INFISH implementation report. Reviews will be conducted by an S.O. and District interdisciplinary team. As with the Timber Sale Unit BMP Audit, representatives from IDL and DEQ will be invited to the additional field reviews for PACFISH and INFISH compliance. In addition, members of the PACFISH Implementation Team will be notified of the field reviews.

Data Storage: S.O. Fisheries files.

Report: Pat Murphy will write an annual summary for the *Forest Plan Monitoring Results Report.*

Cost: $3,000

Personnel Needed: Dependent upon the specific activity and issues, the all or some members of the PACFISH/INFISH Interdisciplinary Team (Pat Murphy - Fisheries, Dick Jones - Hydrology, Byron Bonney - Fire, Jim Mital - Soils and Ecology and Bill Wulf - Silviculture). Pat Murphy and Dick Jones will attend all field reviews; some assistance from other S.O. and District representatives (biologists etc) is recommended.

Responsible Individual: Pat Murphy

Sampling Sites: Potlatch River Drainage:

District	Project	Location	PACFISH/ INFISH	Project Status[1]	Responsibility[2]
Palouse	Fish Habitat Enhancement	E.F. Potlatch River	PACFISH	I	D2
Palouse	Grazing	Potlatch Creek Allotment	PACFISH	I	SO/D2
Palouse	Grazing	W.F. Potlatch Allotment	PACFISH	I	SO/D2
Palouse	Grazing	Corral Creek Allotment	PACFISH	I	D2
Palouse	Grazing	Purdue Creek Allotment	PACFISH	I	D2
Palouse	Grazing	E.F. Bear Creek Allotment	PACFISH	I	D2

Palouse	Grazing	E.F. Corral Creek Allotment	PACFISH	I	D2
Palouse	Mining	Purdue Mine	PACFISH	I	D2
Palouse	Mining	Dinner Mine	PACFISH	I	D2
Palouse	Timber Sale	Upper Palouse Unit 8	PACFISH	I	SO/D2
Palouse	Timber Sale	Upper Palouse Unit 9	PACFISH	I	SO/D2

[1] C - Completed; I - Ongoing; P - Proposed
[2] SO - Supervisor's Office; D1 - Pierce Ranger District; D2 - Palouse R.D.; D3 - North Fork R.D.; D5 - Lochsa R.D.; D6 - Powell R.D.

Sampling Sites: Orofino Creek Drainage:

District	Project	Location	PACFISH/ INFISH	Project Status[1]	Responsibility[2]
Pierce	Mining	Stacey Mine	PACFISH	I	D1
Pierce	Timber Sale	Jenson Creek Unit 2	PACFISH	I	SO/D1
Pierce	Timber Sale	Dewey Cedar Unit 1	PACFISH	C	D1
Pierce	Timber Sale	French Mountain Saddle	PACFISH	P	D1

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Sampling Sites: Lolo Creek Watershed

District	Project	Location	PACFISH/ INFISH	Project Status[1]	Responsibility[2]
Pierce	Fish Enhancement	Lolo Creek	PACFISH	I	D1
Pierce	Structure Maintenance	Lolo Creek	PACFISH	I	D1
Pierce	Sediment Trap Construction	Lolo Creek	PACFISH	I	D1
Pierce	Sediment Removal	Lolo Creek	PACFISH	I	D1
Pierce	Grazing	Musselshell	PACFISH	I	SO/D1
Pierce	Grazing	Nevada/Kate	PACFISH	I	D1
Pierce	Grazing	Yakus	PACFISH	I	D1
Pierce	Mining	Hickman	PACFISH	I	D1
Pierce	Timber Harvest	Lolo Yoosa Unit 9	PACFISH	I	D1
Pierce	Timber Harvest	Coin Purse Units 1, 3	PACFISH	C	D1
Pierce	Timber Harvest	Greer Nelson Unit 11	PACFISH	I	SO/D1
Pierce	Timber Harvest	Fan Lunch	PACFISH	P	D1
Pierce	Timber Harvest	Relaskop Saddle	PACFISH	P	D1
Pierce	Timber Harvest	Mex Mud Saddle	PACFISH	P	D1

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Sampling Sites: Lochsa River Watershed

District	Project	Location	PACFISH/ INFISH	Project Status[1]	Responsibility[2]
Lochsa	Watershed Restoration	District Wide	PACFISH	I	D5
Lochsa	Sediment Traps	Pete King Creek	PACFISH	I	D5
Lochsa	Research Weirs	Lochsa River	PACFISH	I	D5
Lochsa	Fish Creek Weir	Fish Creek	PACFISH	I	D5
Lochsa	Grazing	Yakus Pasture	PACFISH	I	D5/D1
Lochsa	Mining	Pete King Mine	PACFISH	I	D5
Lochsa	Mining	Canyon Creek	PACFISH	I	D5
Lochsa	Timber Harvest	Upper Mystery Units 3,5,6	PACFISH	I	D5
Lochsa	Timber Harvest	Cabin Patch Unit 6	PACFISH	I	SO/D5
Lochsa	Timber Harvest	Long Jungle Units 1,2	PACFISH	C	D5
Lochsa	Timber Harvest	Smith Saddle Units 2-4	PACFISH	C	D5
Powell	Timber Harvest	Spring Creek Heli Units 27-29	PACFISH	C	D6
Powell	Timber Harvest	Brushy Creek 26	PACFISH	I	SO/D6
Powell	Timber Harvest	Brushy Creek 27	PACFISH	I	SO/D6
Powell	Timber Harvest	Amalgamated Units 6, 9	PACFISH	I	D6
Powell	Timber Harvest	Windy Flat Units 4, 5	PACFISH	C	D6
Powell	Timber Harvest	Burnt Cabin Units 1,4	PACFISH	I	D6

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Sampling Sites: North Fork Clearwater River Watershed

District	Project	Location	PACFISH/ INFISH	Project Status	Responsible Unit
Pierce	Fish Habitat Restoration	Orogrande Creek	INFISH	I	D1
North Fork	Outfitters	District Wide	INFISH	I	D3
Pierce	Mining	Stacey Mine	INFISH	I	D1
North Fork	Mining	Jenkins Mine	INFISH	I	SO/D3
Pierce	Engineering	Larch Quarry	INFISH	I	D1
North Fork	Timber Harvest	Cougar 4	INFISH	I	SO/D3
North Fork	Timber Harvest	Cougar 10	INFISH	I	SO/D3

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Instream Monitoring

Monitoring Project Summary Sheet

Type of Monitoring: Baseline

Project Name: Forest-Wide Stream Gages

Stream	District	Township	Range	Section	Record
N.F. Clearwater (At Aquarius Bridge)[1]	North Fork	40N	7E	6	1967-Current
Isabella Creek	North Fork	41N	7E	31	1980-Current
Lochsa River[1]	Lochsa	33N	7E	33	1929-Current
Papoose Creek [2]	Powell	37N	13E	36	1996
Crooked Fork	Powell	37N	14E	34	1980-Current
White Sand Creek	Powell	37N	14E	34	1980-Current

1 U.S.G.S. Station.

2 This mainstem Papoose Creek (mouth) will be monitored as a result of the floods and slides during November/December 1995.

Objectives: These stations compliment the Forest's baseline water quality network. Information is used for predictive purposes.

Parameters: Streamflow and stage. Stations are equipped with continuous read-out Stevens water level recorders.

Frequency: Isabella, Papoose, Crooked Fork, and White Sand Creek gages are operated continuously from April through October. The North Fork and Lochsa River gages are operated continuously, year-long.

Duration: Indefinitely.

Methodology: U.S.G.S. standard methods and techniques for measuring streamflow and maintaining stream gaging stations.

Data Storage: Forest Data General computer system.

Report: As needed.

Cost: $2000 Annually.

Personnel Needed: Brooks Beegle, Gayle Howard and District personnel for data collection. Gayle Howard and Debbie Clark for data storage and reduction.

Responsible Individual: Brooks Beegle for data collection. Gayle Howard for data storage and reduction.

Monitoring Project Summary Sheet

Type of Monitoring: Baseline

Project Name: Forest-wide Sediment Discharge Stations

Stream	District	Beneficial Use[2]	Township	Range	Section	Record
Palouse River[1] (Above L. Sand)	Palouse	Brook Trout Minimum Viable	42N	2W	31	1981-Current
Potlatch River[1] (Below L. Boulder)	Palouse	Rainbow Minimum Viable	40N	1W	33	1995-Current
Fern Creek	North Fork	Cutthroat High Fish	41N	7E	30	1990-Current
Lolo Creek (Mouth)	Pierce	Steelhead	35N	2E	4	1991-Current
Lolo Creek (At Section 6)	Pierce	Steelhead High Fish	34N	6E	6	1980-Current
Eldorado Creek (Below Linda)	Pierce	Steelhead High Fish	34N	6E	21	1991-Current
Pete King Creek	Lochsa	Steelhead High Fish	33N	7E	28	1976-Current
Canyon Creek	Lochsa	Steelhead High Fish	33N	7E	11	1992-Current
Deadman Creek	Lochsa	Steelhead High Fish	33N	8E	6	1980-Current

Stream	District	Beneficial Use[2]	Township	Range	Section	Record
Fish Creek	Lochsa	Steelhead No Effect	35N	9E	33	1992-Current
Squaw Creek[3] (Abv Doe)	Powell	Chinook High Fish	37N	13E	32	1996
W. F. Squaw[3 4] Creek	Powell	Cutthroat High Fish	37N	13E	19	1996
W. F. Papoose Creek[3]	Powell	Steelhead High Fish	37N	13E	24	1996
E.F. Papoose Creek[3]	Powell	Steelhead High Fish	37N	13E	24	1996
Walton Creek[5]	Powell	Steelhead High Fish	37N	14E	34	1992-Current

1 Palouse and Potlatch are year-round gages.
2 Beneficial Uses are found in the Forest Plan, Page K-4.
3 These sites were reestablished as a result of the flood and slides during November/December 1995.
4 Discharge is related to the Squaw Creek above Doe Creek gage.
5 Discharge is related to a Forest-wide stream gage.

Objectives: Provide long-term sediment/discharge data in managed watersheds. Determine the effectiveness of management practices.

Parameters: Stream discharge, suspended sediment, and sediment loading.

Frequency: Stevens water level recorders and ISCO'S operate continuously from March through October. Discharge measurements will be taken a minimum of six times per year, with concentration during the high flow period and one measurement during low flow at the end of the season.

Duration: Indefinitely.

Methodology: Continuous recording gage and ISCO automatic water sampler. U.S.G.S. standard methods and techniques for measuring suspended sediment, streamflow, and maintaining stream gaging stations. A depth integrated suspended sediment sample will be collected every 28 days, or when the ISCO bottles are changed.

Data Storage: Forest Data General computer system.

Report: A report is done on data collected from each station every five to ten years. The information is included in the *Forest Plan Monitoring Results Report.*

Cost: $10,000 Annually.

Personnel Needed: Brooks Beegle, Gayle Howard, Debbie Clark with assistance from District biological technicians for data collection. Gayle Howard and Debbie Clark for data storage and reduction.

Responsible Individual: Brooks Beegle for data collection. Gayle Howard for data storage and reduction.

Monitoring Project Summary Sheet

Type of Monitoring: Baseline and Validation

Project Name: Forest-wide Sediment Discharge and Bedload Stations

Stream	District	Beneficial Use[1]	Township	Range	Section	Record
Elk Creek	Palouse	Brook Trout High Fish	40N	2E	23	1981-Current
Quartz Creek[2]	North Fork	Cutthroat High Fish	40N	8E	16	1981-Current

1 Beneficial Uses are found in the Forest Plan, Page K-4.
2 This site was established as a result of the large slide event in October 1995.

Objectives: Provide long-term suspended and bedload sediment/discharge data in disturbed watersheds. Determine the rate of channel recovery from the Quartz Creek landslide and the Elk Creek debris torrent.

Parameters: Stream discharge, suspended and bedload sediment, and sediment loading.

Frequency: Stevens water level recorders and ISCO'S operate continuously from March through October. Discharge measurements will be taken a minimum of six times per year, with concentration during the high flow period and one measurement during low flow at the end of the season. Bedload samples will

be collected from 12 to 20 times per year, with concentration on the rising limb of the hydrograph and at peak flow.

Duration: Lolo Creek and Elk Creek - indefinitely.

Methodology: Continuous recording gage and ISCO automatic water sampler. U.S.G.S. standard methods and techniques for measuring suspended and bedload sediment, streamflow, and maintaining stream gaging stations. A depth integrated suspended sediment sample will be collected every 28 days, or when the ISCO bottles are changed.

Data Storage: Forest Data General computer system.

Report: A report is done on data collected from each station every five to ten years. The information is included in the *Forest Plan Monitoring Results Report.*

Cost: $7,000 Annually.

Personnel Needed: Brooks Beegle with assistance from District biological technicians for data collection. Gayle Howard and Debbie Clark for data storage and reduction.

Responsible Individual: Brooks Beegle for data collection. Gayle Howard for data storage and reduction.

Monitoring Project Summary Sheet

Type of Monitoring: Effectiveness

Project Name: Forest-wide Project Monitoring. Continuous Sediment Discharge Stations

Stream	District	Beneficial Use[1]	Record	Activity
Salmon Creek (Lower)	North Fork	Cutthroat High Fish	1986-Current	Road Construction and Lower Salmon Timber Sale
Salmon Creek (Upper)	North Fork	Cutthroat High Fish	1986-Current	Control Above Activities

Stream	District	Beneficial Use[1]	Record	Activity
Pete King Creek	Lochsa	Steelhead High Fish	1994-Current	Study the Effects of an Instream Sediment Trap on Suspended Sediment
Walton Creek	Powell	Steelhead High Fish	1993-Current	Monitor Suspended Sediment From Roads Produced By Summer Rain Storms

[1] Beneficial Uses are found in the Forest Plan, Page K-4.

Objectives: Determine the effectiveness of BMPs and management practices in preventing sediment delivery to streams. Determine the recovery rates of watersheds that have been impacted in the past.

Parameters: Stream discharge, suspended sediment, and sediment loading.

Frequency: Stevens water level recorders and ISCO'S operate continuously from March through October, except for Walton Creek Storm that operates From June to September. Discharge measurements will be taken a minimum of six times per year, with concentration during the high flow period and one measurement during low flow at the end of the season.

Duration: Three to Ten Years.

Methodology: Continuous recording gage and ISCO automatic water sampler. U.S.G.S. standard methods and techniques for measuring suspended sediment, streamflow, and maintaining stream gaging stations. A depth integrated suspended sediment sample will be collected every 28 days, or when the ISCO bottles are changed.

Data Storage: Forest Data General computer system.

Report: A report is done on data collected from each station at the end of the sampling period. The information is included in the *Forest Plan Monitoring Results Report.*

Cost: $5000 Annually.

Personnel Needed: Brooks Beegle, Gayle Howard, Debbie Clark with assistance from District

biological technicians for data collection. Gayle Howard and Debbie Clark for data storage and reduction.

Responsible Individual: Brooks Beegle for data collection. Gayle Howard for data storage and reduction.

Monitoring Project Summary Sheet

Type of Monitoring: Effectiveness

Project Name: Forest-wide Water Temperature Monitoring

Objectives: Determine the effectiveness of BMPs and management practices in preventing stream temperature increases.

Parameters: Water temperature.

Frequency: Continuous, June through September.

Duration: One to five Years.

Methodology: Continuous recording thermographs. The Forest uses Ryan TempMentor and Hobo thermographs that record stream water temperature.

Data Storage: District files.

Report: A report is done by the District Biologist and submitted to the Forest Fisheries Biologist at the end of the sampling period. Some of these reports are selected for inclusion in the *Forest Plan Monitoring Results Report.*

Cost: $25,000 Annually.

Personnel Needed: District Biological Technicians.

Responsible Individual: Dave Schoen for technical assistance. Each District Biologist is responsible for his/her data maintenance and analysis.

Sampling Sites: Palouse River

Stream	District	Beneficial Use[1]	Record	Activity
Palouse River (Station)	Palouse	Brook Trout Minimum Viable	1996	Timber Sales Grazing
Meadow Creek	Palouse	Brook Trout Minimum Viable	1996	Timber Sales Grazing

Sampling Sites: Potlatch River

Stream	District	Beneficial Use[1]	Record	Activity
Potlatch River	Palouse	Rainbow Minimum Viable	1993-1996	Timber Sales Grazing
Potlatch River (Abv W F)	Palouse	Rainbow Minimum Viable	1995-1996	Timber Sales Grazing
W.F. Potlatch River	Palouse	Rainbow Minimum Viable	1995-1996	Timber Sales Grazing
Cougar Creek	Palouse	Rainbow Minimum Viable	1996	Timber Sales Grazing
Feather Creek	Palouse	Rainbow Minimum Viable	1996	Timber Sales Grazing
Nat Brown	Palouse	N/A	1996	Timber Sales Grazing

Sampling Sites: North Fork Clearwater River

Stream	District	Beneficial Use[1]	Record	Activity
Elk Creek Station	Palouse	Brook Trout High Fish	1994-1996	Timber Sales Grazing
Elk Creek Upper Basin	Palouse	Brook Trout High Fish	1994-1996	Timber Sales Grazing
Elk Creek (Abv Reservoir)	Palouse	Brook Trout Minimum Viable	1994-1996	Timber Sales Grazing
Elk Creek (Blw Reservoir)	Palouse	Brook Trout Minimum Viable	1994-1996	Timber Sales Grazing
Quartz Creek	North Fork	Cutthroat High Fish	1992-1996	Timber Sales
Cougar Creek	North Fork	Cutthroat Moderate Fish	1994-1996	Timber Sales
Grizzly Creek	North Fork	Cutthroat Moderate Fish	1994-1996	Timber Sales
Cold Springs Creek	North Fork	Cutthroat High Fish	1995-1996	Timber Sales
Cool Creek	North Fork	Cutthroat High Fish	1995-1996	Timber Sales
Pete Ott Creek	North Fork	Cutthroat High Fish	1995-1996	Baseline
Elizabeth Creek	North Fork	Cutthroat High Fish	1995-1996	Baseline
Fix Creek	North Fork	Cutthroat High Fish	1995-1996	Timber Sales
North Fork of the Clearwater River @ Cedars	North Fork	Cutthroat No Effect	1994	Baseline

Stream	District	Beneficial Use[1]	Record	Activity
North Fork of the Clearwater River (Abv Bostonian)	North Fork	Cutthroat High Fish	1995-1996	Baseline
Birch Creek	North Fork	N/A	1995-1996	Timber Sales
Meadow Creek	North Fork	Cutthroat High Fish	1994-1996	Timber Sales
Vanderbilt Creek	North Fork	Cutthroat High Fish	1994-1996	Baseline
Placer Creek	North Fork	N/A	1994-1996	Baseline
Bostonian Creek	North Fork	Cutthroat High Fish	1994-1996	Baseline
Niagara Creek	North Fork	Cutthroat High Fish	1994-1996	Baseline
Long Creek	North Fork	Cutthroat High Fish	1994-1996	Timber Sales
Rawhide Creek	North Fork	N/A	1994-1996	Timber Sales
Slate Creek	North Fork	Cutthroat High Fish	1994-1996	Timber Sales
Short Creek	North Fork	Cutthroat High Fish	1994-1996	Timber Sales
Lake Creek	North Fork	Cutthroat High Fish	1994-1996	Timber Sales
Moose Creek	North Fork	Cutthroat High Fish	1994-1996	Mining, Timber Sales
Osier Creek	North Fork	Cutthroat High Fish	1994-1996	Mining, Timber Sales
China Creek	North Fork	Cutthroat High Fish	1994-1996	Timber Sales

Stream	District	Beneficial Use[1]	Record	Activity
Laundry Creek	North Fork	Cutthroat High Fish	1994-1996	Timber Sales
Deadwood Creek	North Fork	Cutthroat High Fish	1994-1996	Mining, Timber Sales
Independence Creek	North Fork	Moderate Fish Proposed	1994-1996	Mining, Timber Sales
Fisher Creek	North Fork	Cutthroat High Fish	1995-1996	Baseline
Trail Creek	North Fork	Cutthroat High Fish	1995-1996	Baseline
Sneak Creek	North Fork	Cutthroat High Fish	1994-1996	Timber Sales
Sheep Creek	North Fork	Cutthroat High Fish	1994-1996	Timber Sales
Isabella Creek	North Fork	Cutthroat High Fish	1994-1996	Timber Sales
Black Creek	North Fork	Cutthroat Moderate Fish	1994-1996	Baseline
Fern Creek	North Fork	Cutthroat High Fish	1994-1996	Timber Sales
Leuty Creek	North Fork	N/A	1995-1996	Timber Sales
Sourdough Creek	North Fork	Cutthroat Moderate Fish	1994-1996	Timber Sales
Len Creek	North Fork	N/A	1994-1996	Timber Sales
Weitas Creek	Pierce	Cutthroat No Effect	1994-1996	Baseline

Stream	District	Beneficial Use[1]	Record	Activity
Hemlock Creek	Pierce	Cutthroat High Fish	1994-1996	Baseline
Larch Creek	Pierce	Cutthroat High Fish	1994-1996	Baseline
Little Weitas Creek	Pierce	Cutthroat High Fish	1994-1996	Baseline
Middle Creek	Pierce	Cutthroat Moderate Fish	1994-1996	Timber Sales
Orogrande Creek	Pierce	Cutthroat Low Fish	1994-1996	Baseline
Fuzzy Creek	Pierce	Cutthroat Low Fish	1995-1996	Timber Sales
Pine Creek	Pierce	Cutthroat Low Fish	1994-1996	Timber Sales
Hook Creek	Pierce	N/A	1995-1996	Timber Sales
Knute Creek	Pierce	N/A	1995-1996	Timber Sales
Jazz Creek	Pierce	N/A	1995-1996	Timber Sales
Elk Creek	Pierce	N/A	1995-1996	Timber Sales
Grand Creek	Pierce	N/A	1995-1996	Timber Sales
Cache Creek	Pierce	N/A	1995-1996	Timber Sales
French Creek	Pierce	Cutthroat Low Fish	1994-1996	Timber Sales
Sylvan Creek	Pierce	Cutthroat High Fish	1991-1996	Timber Sales
Hem Creek	Pierce	Cutthroat High Fish	1994-1996	Timber Sales
Cayuse Creek	Powell	Cutthroat No Effect	1994-1996	Baseline

Stream	District	Beneficial Use[1]	Record	Activity
Silver Creek	Powell	Cutthroat No Effect	1994-1996	Baseline

Sampling Sites: Lolo Creek

Stream	District	Beneficial Use[1]	Record	Activity
Lolo Creek	Pierce	Steelhead High Fish	1989-1996	Baseline
Lolo Creek Air	Pierce	Steelhead High Fish	1989-1996	Baseline
Dutchman Creek	Pierce	Steelhead High Fish	1995-1996	Timber Sales
Knoll Creek	Pierce	Steelhead High Fish	1995-1996	Timber Sales
Yakus Creek	Pierce	Cutthroat High Fish	1994-1996	Timber Sales
Camp Creek	Pierce	Steelhead High Fish	1990-1996	Timber Sales
Musselshell Creek	Pierce	Steelhead High Fish	1990-1996	Timber Sales
Dan Lee Creek	Pierce	N/A	1994-1996	Timber Sales
Gold Creek	Pierce	Cutthroat Moderate Fish	1995-1996	Timber Sales
Mud Creek	Pierce	Cutthroat Moderate Fish	1994-1996	Timber Sales
Eldorado Creek (Abv Six Bit)	Pierce	Steelhead High Fish	1989-1996	Baseline

Lunch Creek	Pierce	Steelhead High Fish	1990-1996	Timber Sales
Cedar Creek	Pierce	Cutthroat Moderate Fish	1992-1996	Timber Sales
Six Bit Creek	Pierce	Steelhead High Fish	1990-1996	Timber Sales
Trout Creek	Pierce	Steelhead High Fish	1990-1996	Timber Sales
Fan Creek	Pierce	Steelhead High Fish	1990-1996	Timber Sales

Sampling Sites: Lochsa River

Stream	District	Beneficial Use[1]	Record	Activity
Lochsa River	Lochsa	Steelhead No Effect	1993-1996	Baseline
Pete King Creek	Lochsa	Steelhead High Fish	1990-1996	Timber Sales
W.F. Pete King Creek	Lochsa	Steelhead High Fish	1991-1996	Timber Sales
Polar Creek	Lochsa	Steelhead High Fish	1992-1996	Timber Sales
Walde Creek	Lochsa	Steelhead High Fish	1991-1996	Timber Sales
Placer Creek	Lochsa	Steelhead High Fish	1994-1996	Timber Sales
Nut Creek	Lochsa	Steelhead High Fish	1992-1996	Timber Sales
Canyon Creek	Lochsa	Steelhead High Fish	1991-1996	Timber Sales

Stream	District	Beneficial Use[1]	Record	Activity
S.F. Canyon Creek	Lochsa	Steelhead High Fish	1992-1996	Timber Sales
Bonanza Creek	Lochsa	N/A	1991-1996	Timber Sale
Mystery Creek	Lochsa	Cutthroat High Fish	1991-1996	Timber Sales
Glade Creek	Lochsa	Steelhead High Fish	1993-1996	Timber Sales
Deadman Creek	Lochsa	Steelhead High Fish	1990-1996	Timber Sales
Deadman Air	Lochsa	Steelhead High Fish	1990-1996	Baseline
W.F. Deadman	Lochsa	Steelhead High Fish	1992-1996	Timber Sales
Bimerick Creek	Lochsa	Cutthroat High Fish	1993-1996	Baseline
Fish Creek	Lochsa	Steelhead No Effect	1994-1996	Baseline
Hungery Creek	Lochsa	Steelhead No Effect	1990-1996	Baseline
Sherman Creek	Lochsa	Steelhead No Effect	1994-1996	Baseline
Bald Mountain Creek	Lochsa	Cutthroat No Effect	1994-1996	Baseline
Coolwater Creek	Lochsa	Steelhead High Fish	1995-1996	Baseline
Fire Creek	Lochsa	No Effect	1995-1996	Baseline
Split Creek	Lochsa	No Effect	1995-1996	Baseline
Old Man Creek	Lochsa	No Effect	1995-1996	Baseline
Boulder Creek	Lochsa	No Effect	1994-1996	Baseline

Stream	District	Beneficial Use[1]	Record	Activity
Weir Creek	Powell	Steelhead High Fish	1995-1996	Baseline
E.F. Weir Creek	Powell	Steelhead High Fish	1995-1996	Baseline
W.F.Weir Creek	Powell	Steelhead High Fish	1995-1996	Baseline
Post Office Creek	Powell	Steelhead High Fish	1995-1996	Timber Sales
EF Post Office	Powell	Steelhead High Fish	1995-1996	Timber Sales
WF Post Office	Powell	Steelhead High Fish	1995-1996	Timber Sales
Squaw Creek	Powell	Chinook High Fish	1990-1996	Timber Sales
WF Squaw Creek	Powell	Cutthroat High Fish	1994-1996	Timber Sales
WF Squaw (Abv Spring)	Powell	Cutthroat High Fish	1995-1996	Timber Sales
Spring Creek	Powell	Cutthroat High Fish	1994-1996	Timber Sales
EF Squaw Creek	Powell	Cutthroat High Fish	1994-1996	Timber Sales
Doe Creek	Powell	Steelhead High Fish	1994-1996	Timber Sales
Papoose Creek	Powell	Steelhead High Fish	1991-1996	Timber Sales
EF Papoose Creek	Powell	Steelhead High Fish	1995-1996	Timber Sales
WF Papoose Creek	Powell	Steelhead High Fish	1995-1996	Timber Sales

Stream	District	Beneficial Use[1]	Record	Activity
Parachute Creek	Powell	Steelhead High Fish	1995-1996	Timber Sales
Crooked Fork Creek	Powell	Chinook No Effect	1990-1996	Timber Sales
Shotgun Creek	Powell	Steelhead High Fish	1995-1996	Timber Sales
Brushy Fork (Lower)	Powell	Chinook No Effect	1990-1996	Timber Sales
Brushy Fork (Mid)	Powell	Chinook No Effect	1995-1996	Timber Sales
SF Spruce Creek	Powell	Steelhead High Fish	1994-1996	Timber Sales
White Sand Creek	Powell	Chinook No Effect	1990-1996	Timber Sales
White Sand Creek (Upper	Powell	Steelhead No Effect	1995-1996	Timber Sales
Cabin Creek	Powell	Cutthroat High Fish	1994-1996	Timber Sales
Storm Creek	Powell	Cutthroat No Effect	1994-1996	Baseline
Maud Creek	Powell	Cutthroat No Effect	1994-1996	Baseline
Dan Creek	Powell	Chinook No Effect	1994-1996	Baseline
Fern Creek	Powell	Chinook No Effect	1994-1996	Baseline
Colt Creek	Powell	Steelhead High Fish	1994-1996	Timber Sales
Savage Creek	Powell	Cutthroat High Fish	1994-1996	Timber Sales
Big Flat Creek	Powell	No Effect	1994-1996	Baseline

Stream	District	Beneficial Use[1]	Record	Activity
Big Sand	Powell	Cutthroat No Effect	1994-1996	Baseline
Walton Creek	Powell	Steelhead High Fish	1991-1996	Timber Sales
Warm Springs Creek	Powell	Steelhead High Fish	1995-1996	Baseline
Cooperation Creek	Powell	Cutthroat High Fish	1995-1996	Baseline
Wind Lake Creek	Powell	Steelhead High Fish	1995-1996	Baseline

1 Beneficial Uses are found in the Forest Plan, Page K-4.

Monitoring Project Summary Sheet

Type of Monitoring: Effectiveness

Project Name: Forest-wide Stream Channel Morphology

Objectives: Determine the effectiveness of BMPs and management practices in preventing harmful changes to stream channel geomorphological characteristics, including stream width, substrate composition, and gradient. Secondly, to determine stream channel geomorphological conditions in undeveloped roadless/wilderness areas (reference streams) for comparison to developed watersheds.

Parameters: Particle size distribution, cobble embeddedness, channel cross section, and gradient of the water surface.

Frequency: For permanent monitoring sites: one survey every three to five years. For baseline stream surveys: surveys may only be conducted once every ten to twenty years or on a regular schedule dependent if the stream is selected as a reference stream or as a permanent monitoring site.

Duration: For permanent monitoring sites: before activities to five years after activities. For baseline stream surveys: one survey every three to five years for reference streams and additional surveys if site is selected as permanent monitoring site.

Methodology: Standard procedures found in *Riffle Stability Index, a procedure to evaluate stream reach and watershed equilibrium,* Gary Kappesser, Forest Hydrologist, Idaho Panhandle National Forests. The preferred method is the 30 particle count procedure. This method will be used when point or mid-channel bars are present. If point or mid-channel bars are not present, the stream channel survey procedure will be used. The cobble embeddedness will be ocularly estimated accordingly to Espinosa 1988. Calibrations will be completed for each observer conducting visual determinations of cobble embeddedness levels (Burns and Edwards 1985, and Hankin and Reeves 1988). Embeddedness values will be weighted according to the procedures described by Torquemada and Platts (1988) to account for the embeddedness of surficial materials that could not be measured.

Data Storage: S.O. Watershed files.

Report: A report will be done after the second measurement to determine trend. Some reports are selected for inclusion in the *Forest Plan Monitoring Results Report.*

Personnel Needed: District Hydrologist or Hydrological and Biological Technicians. A minimum of two people are needed for each measurement.

Cost: $3,000 annually for permanent monitoring sites. Additional $10,500 is estimated for the sites associated with the flood and slide assessment. Costs for work conducted as part of the baseline stream surveys varies annually dependent upon the number and location of the streams.

Responsible Individual: District personnel for data collection. Gayle Howard for data collection techniques and maintenance.

Sample Sites: Palouse River Drainage

Stream	District	Beneficial Use[1]	Record	Activity
Gold Creek[2]	Palouse	Brook Trout Minimum Viable	1996	Timber Sales Grazing Baseline Stream Survey

Stream	District	Beneficial Use[1]	Record	Activity
Big Creek	Palouse	Brook Trout Minimum Viable	1996	Timber Sales Grazing
Blakes Fork	Palouse	Brook Trout Minimum Viable	1996	Timber Sales Grazing
White Pine Creek	Palouse	N/A	1996	Timber Sales Grazing
N.F. Palouse River	Palouse	Rainbow Low Fish	1996	Timber Sales Grazing
Palouse River (downstream of Strychnine Creek)	Palouse	Brook Trout Minimum Viable	1996	1995-96 Flood Assessment
Big Sand Creek	Palouse	Brook Trout Minimum Viable	1996	Timber Sales Grazing

[2] Survey will be conducted as part of the baseline stream survey work.

Sample Sites: North Fork Clearwater River Drainage

Stream	District	Beneficial Use[1]	Record	Activity
Elk Creek (Station)	Palouse	Brook Trout High Fish	1993-1996	Debris Torrent
Elk Creek Slide Impact Zone	Palouse	Brook Trout High Fish	1993-1996	Debris Torrent
Elk Creek (mouth)[2]	Palouse	Brook Trout High Fish	1996	Baseline Stream Survey
West Fork Elk Creek[2]	Palouse	Brook Trout High Fish	1996	Baseline Stream Survey

Stream	District	Beneficial Use[1]	Record	Activity
Shite Creek[2]	Palouse	Brook Trout High Fish	1996	Baseline Stream Survey
Morris Creek[2]	Palouse	Brook Trout High Fish	1996	Baseline Stream Survey
Deer Creek[2]	Palouse	Brook Trout High Fish	1996	Baseline Stream Survey
Deep Creek[2]	Palouse	Brook Trout Minimum Viable	1996	Baseline Stream Survey
Bull Run Creek[2]	Palouse	Brook Trout Minimum Viable	1996	Baseline Stream Survey
Lindley Creek[2]	Palouse	Brook Trout Minimum Viable	1996	Baseline Stream Survey
Cloverleaf Creek[2]	Palouse	Brook Trout Minimum Viable	1996	Baseline Stream Survey
Orogrande Creek (Mouth)	Pierce	Cutthroat Low Fish	1994, 1996	1995-96 Flood Assessment Timber Sales
Orogrande Creek (Abv French)	Pierce	Cutthroat Low Fish	1994, 1996	1995-96 Flood Assessment Timber Sales
Star Creek[2]	North Fork	N/A	1996	Baseline Stream Survey
Grasshopper Creek[2]	North Fork	N/A	1996	Baseline Stream Survey
Lost Pete Creek[2]	North Fork	Cutthroat High Fish	1996	Baseline Stream Survey
Lower Twin Creek[2]	North Fork	Cutthroat High Fish	1996	Baseline Stream Survey

Stream	District	Beneficial Use[1]	Record	Activity
Upper Twin Creek[2]	North Fork	N/A	1996	Baseline Stream Survey
Unnamed Long Creek Tributary (LGB)[2]	North Fork	N/A	1996	Baseline Stream Survey
Unnamed Tributary (Birch Mountain BHT)[2]	North Fork	N/A	1996	Baseline Stream Survey
Pete Ott Creek[2]	North Fork	Cutthroat High Fish	1996	Baseline Stream Survey
Elizabeth Creek[2]	North Fork	Cutthroat No Effect	1996	Baseline Stream Survey
Tillie Lake Tributary (ELB)[2]	North Fork	Cutthroat No Effect	1996	Baseline Stream Survey
Elizabeth Lake Tributary (ELC)[2]	North Fork	Cutthroat No Effect	1996	Baseline Stream Survey
Fix Creek[2]	North Fork	Cutthroat High Fish	1996	Baseline Stream Survey
Gravey Creek	Powell	Cutthroat High Fish	1995-96	1995-96 Flood Assessment Timber Sales

[2] Survey will be conducted as part of the baseline stream survey work.

Sample Sites: Lolo Creek Drainage

Stream	District	Beneficial Use[1]	Record	Activity
Lolo Creek (Sign Hole)	Pierce	Steelhead High Fish	1993, 1996	1995-96 Flood Assessment Timber Sales
Lolo Creek (downstream of Yoosa Creek)	Pierce	Steelhead High Fish	1993, 1996	1995-96 Flood Assessment Timber Sales
Lolo Creek (@ Section 6 Bridge)	Pierce	Steelhead High Fish	1993, 1996	1995-96 Flood Assessment Timber Sales
Eldorado Creek (Mouth)	Pierce	Steelhead High Fish	1993, 1996	1995-96 Flood Assessment Timber Sales
Eldorado Creek (upstream of Fan Creek)	Pierce	Steelhead High Fish	1993, 1996	1995-96 Flood Assessment Timber Sales

[1] Beneficial Uses are found in the Forest Plan, Page K-4.

Sample Sites: Lochsa River Drainage

Stream	District	Beneficial Use[1]	Record	Activity
Lochsa River	Lochsa Powell	Steelhead No Effect	1994, 1996	1995-96 Flood Assessment Landslides Debris Torrents
East Fork Split Creek[2]	Lochsa	N/A No Effect	1996	Baseline Stream Survey
Old Man Creek[2]	Lochsa	N/A No Effect	1996	Baseline Stream Survey
Chimney Creek[2]	Lochsa	N/A No Effect	1996	Baseline Stream Survey

Stream	District	Beneficial Use[1]	Record	Activity
Big Stew Creek[2]	Lochsa	N/A No Effect	1996	Baseline Stream Survey
Huckleberry Creek[2]	Lochsa	N/A No Effect	1996	Baseline Stream Survey
Grit Creek[2]	Lochsa	N/A No Effect	1996	Baseline Stream Survey
Rock Lake Creek[2]	Lochsa	N/A No Effect	1996	Baseline Stream Survey
Lone Knob Creek[2]	Lochsa	N/A No Effect	1996	Baseline Stream Survey
Pass Creek[2]	Lochsa	N/A No Effect	1996	Baseline Stream Survey
Hard Creek[2]	Lochsa	N/A No Effect	1996	Baseline Stream Survey
Noseeum Creek[2]	Lochsa	N/A	1996	Baseline Stream Survey
Castle Creek[2]	Lochsa	N/A	1996	Baseline Stream Survey
Holly Creek[2]	Lochsa	Cutthroat No Effect	1996	Baseline Stream Survey
Skookum Creek[2]	Lochsa	N/A	1996	Baseline Stream Survey
Tick Creek[2]	Lochsa	N/A	1996	Baseline Stream Survey
Tom Cat Creek[2]	Lochsa	N/A	1996	Baseline Stream Survey
Macaroni Creek[2]	Lochsa	N/A	1996	Baseline Stream Survey
Snowshoe Creek[2]	Lochsa	N/A	1996	Baseline Stream Survey
East Fork Deadman Creek[2]	Lochsa	N/A	1996	Baseline Stream Survey
Unnamed Tributary - EF Deadman Creek[2]	Lochsa	Steelhead High Fish	1996	Baseline Stream Survey

Stream	District	Beneficial Use[1]	Record	Activity
Unnamed Tributary - Deadman Creek[2]	Lochsa	Steelhead High Fish	1996	Baseline Stream Survey
Middle Fork Deadman Creek[2]	Lochsa	Cutthroat High Fish	1996	Baseline Stream Survey
Unnamed Tributary - Middle Fork Deadman Creek[2]	Lochsa	Cutthroat High Fish	1996	Baseline Stream Survey
West Fork Deadman Creek[2]	Lochsa	Steelhead High Fish	1996	Baseline Stream Survey
Unnamed Tributary - West Fork Deadman Creek[2]	Lochsa	Steelhead High Fish	1996	Baseline Stream Survey
Unnamed Tributary - West Fork Deadman Creek[2]	Lochsa	Steelhead High Fish	1996	Baseline Stream Survey
Eagle Mountain Creek[2]	Powell	N/A No Effect	1996	Baseline Stream Survey
Indian Meadows Creek[2]	Powell	N/A No Effect	1996	Baseline Stream Survey
Mocus Creek[2]	Powell	N/A	1996	Baseline Stream Survey
Mocus Point Creek[2]	Powell	N/A	1996	Baseline Stream Survey
Bear Mountain Creek[2]	Powell	N/A	1996	Baseline Stream Survey
Colgate Creek[2]	Powell	N/A	1996	Baseline Stream Survey
Eagle Creek[2]	Powell	Steelhead High Fish	1996	Baseline Stream Survey

Stream	District	Beneficial Use[1]	Record	Activity
Robin Creek[2]	Powell	Steelhead High Fish	1996	Baseline Stream Survey
Jay Creek[2]	Powell	Steelhead High Fish	1996	Baseline Stream Survey
Unnamed Lochsa Face Tributary[2]	Powell	N/A	1996	Baseline Stream Survey
Unnamed Lochsa Face Tributary[2]	Powell	N/A	1996	Baseline Stream Survey
Unnamed Lochsa Face Tributary[2]	Powell	N/A	1996	Baseline Stream Survey
Unnamed Lochsa Face Tributary[2]	Powell	N/A	1996	Baseline Stream Survey
Unnamed Lochsa Face Tributary[2]	Powell	N/A	1996	Baseline Stream Survey
Unnamed Lochsa Face Tributary[2]	Powell	N/A	1996	Baseline Stream Survey
Unnamed Lochsa Face Tributary[2]	Powell	N/A	1996	Baseline Stream Survey
Unnamed Lochsa Face Tributary[2]	Powell	N/A	1996	Baseline Stream Survey
Unnamed Lochsa Face Tributary[2]	Powell	N/A	1996	Baseline Stream Survey
Unnamed Lochsa Face Tributary[2]	Powell	N/A	1996	Baseline Stream Survey
Unnamed Lochsa Face Tributary[2]	Powell	N/A	1996	Baseline Stream Survey
Ashpile Creek[2]	Powell	N/A	1996	Baseline Stream Survey
Ginger Creek[2]	Powell	N/A	1996	Baseline Stream Survey
Unnamed Lochsa Face Tributary[2]	Powell	N/A	1996	Baseline Stream Survey
Burnt Cedar Creek[2]	Powell	N/A	1996	Baseline Stream Survey

Stream	District	Beneficial Use[1]	Record	Activity
Cold Storage Creek[2]	Powell	N/A	1996	Baseline Stream Survey
Unnamed Lochsa Face Tributary[2]	Powell	N/A	1996	Baseline Stream Survey
Powell Creek[2]	Powell	N/A	1996	Baseline Stream Survey
Boulder Creek[2]	Powell	Steelhead High Fish	1996	Baseline Stream Survey
Fox Creek[2]	Powell	Steelhead High Fish	1996	Baseline Stream Survey
Shotgun Creek[2]	Powell	Steelhead High Fish	1996	Baseline Stream Survey
Rock Creek[2]	Powell	Cutthroat High Fish	1996	Baseline Stream Survey
Haskell Creek[2]	Powell	Cutthroat High Fish	1996	Baseline Stream Survey
Hopeful Creek[2]	Powell	Steelhead No Effect	1996	Baseline Stream Survey
Lost Creek	Powell	Cutthroat High Fish	1996	1995-96 Flood Assessment Timber Sales
Post Office Creek	Powell	Steelhead High Fish	1988, 1992, 1996	1995-96 Flood Assessment Timber Sales
Lower Squaw Creek	Powell	Chinook High Fish	1995, 1996	1995-96 Flood Assessment Timber Sales
West Fork Squaw Creek	Powell	Cutthroat High Fish	1995, 1996	1995-96 Flood Assessment Timber Sales
Spring Creek	Powell	Cutthroat High Fish	1996	1995-96 Flood Assessment Timber Sales
Doe Creek	Powell	Steelhead High Fish	1995, 1996	1995-96 Flood Assessment Timber Sales

Stream	District	Beneficial Use[1]	Record	Activity
Lower Papoose Creek	Powell	Steelhead High Fish	1988, 1992, 1996	1995-96 Flood Assessment Timber Sales
WF Papoose Creek	Powell	Steelhead High Fish	1995, 1996	1995-96 Flood Assessment Timber Sales
EF Papoose Creek	Powell	Steelhead High Fish	1995, 1996	1995-96 Flood Assessment Timber Sales
Parachute Creek	Powell	Steelhead High Fish	1995-1996	Landslide Timber Sales
Crooked Fork Creek	Powell	Chinook No Effect	1996	1995-96 Flood Assessment Timber Sales
Brushy Fork Creek	Powell	Chinook No Effect	1996	1995-96 Flood Assessment Timber Sales
White Sand Creek	Powell	Chinook No Effect	1996	1995-96 Flood Assessment Timber Sales
Beaver Creek	Powell	Cutthroat High Fish	1995, 1996	1995-96 Flood Assessment Timber Sales
Colt Creek	Powell	Steelhead High Fish	1995, 1996	1995-96 Flood Assessment Timber Sales
Savage Creek	Powell	Cutthroat High Fish	1995, 1996	1995-96 Flood Assessment Timber Sales
Walton Creek	Powell	Steelhead High Fish	1995, 1996	1995-96 Flood Assessment Timber Sales

[1] Beneficial Uses are found in the Forest Plan, Page K-4.
[2] Survey will be conducted as part of the baseline stream survey work.

Monitoring Project Summary Sheet

Type of Monitoring: Trend/Effectiveness

Project Name: Fish Population Monitoring - Composition/Abundance (This project does not include the baseline fish population surveys that will be conducted during the stream surveys).

Objectives: Determine annual population trends of anadromous and resident fish species within selected streams throughout the Forest. Secondly, continue to monitor the effectiveness of fisheries habitat enhancement projects on selected streams. Validation of Forest Plan's land allocation for various watersheds in relation to maintaining water quality standards.

Parameters: Fish composition, enumeration by species and size (age class), fish data reported for each habitat type and per 100 square meters.

Frequency: Population sampling will be conducted annually and only during the period from July 15 through September 10.

Duration: Indefinite.

Methodology: Standard snorkel survey techniques will be used to collect fish abundance data. Each monitoring site is delineated by habitat type (pool, pocket water, alcove, riffle, run and glide). Each specific habitat area is snorkeled to determine fish composition, numbers etc. Fish data is recorded for each segment. The habitat segments are measured (length and average width) after snorkeling is completed.

Data Storage: District and S.O. Fisheries files.

Report: A report will be done by the District Biologists and submitted to the Forest Fisheries Biologist at the end of the sampling period. Portions of the reports are selected for inclusion in the *Forest Plan Monitoring Results Report.*

Cost: $20,000 annually.

Personnel Needed: District Fisheries Biologist, Biological Technicians, and Forest Fisheries Biologist. A minimum of two people are needed for each area.

Responsible Individual: District Fisheries Biologist for data collection and initial report. Pat Murphy for report summaries for the Forest Plan Monitoring Results Report.

Sampling Site: Lolo Creek Drainage:

Stream	District	Survey Type	# Of Stations	Record
Lolo Creek	Pierce	Snorkeling	15	1988-1994,1996
Lolo Creek[1]	Pierce	Snorkeling	29	1989-1996
Eldorado Creek[1]	Pierce	Snorkeling	17	1989-1996
Yoosa Creek[1]	Pierce	Snorkeling	10	1989-1996

[1] Monitoring conducted by the Nez Perce Tribal Fisheries Department.

Sampling Site: Lochsa River Drainage:

Stream	District	Survey Type	# Of Stations	Record
Pete King Creek	Lochsa	Snorkeling	10	1982-96
Deadman Creek	Lochsa	Snorkeling	10	1982-96
Fish Creek	Lochsa	Snorkeling	50	1978-96
Hungery Creek	Lochsa	Snorkeling	40	1978-96
Weir Creek	Powell	Snorkeling	5	1988, 1990, 1992, 1994,1996
Post Office Creek	Powell	Snorkeling	5	1988, 1990, 1992, 1994,1996
Squaw Creek	Powell	Snorkeling	5	1988, 1990, 1992, 1994,1996
Papoose Creek	Powell	Snorkeling	5	1988, 1990, 1992, 1994,1996

Brushy Fork Creek	Powell	Snorkeling	5	1988, 1990, 1992, 1994,1996
Squaw Creek[1]	Powell	Snorkeling	22	1992-1996
Papoose Creek[1]	Powell	Snorkeling	15	1992-1996

[1] Monitoring conducted by the Nez Perce Tribal Fisheries Department.

Monitoring Project Summary Sheet

Type of Monitoring: Trend/Effectiveness

Project Name: Fish Population Monitoring - Adult Spawning Success

Objectives: To assess spawning success of spring chinook salmon and bull trout through the enumeration of redds and numbers of live fish and carcasses (salmon). Counts with these study areas would provide trend data and baseline data with which to assess the adult escapement of naturally-reproducing spring chinook salmon. populations. Determine annual population trends of anadromous and resident fish species within selected streams throughout the Forest. Secondly, continue to monitor the effectiveness of fisheries habitat enhancement projects on selected streams. Validation of Forest Plan's land allocation for various watersheds in relation to maintaining water quality standards.

Parameters: Numbers of spring chinook salmon redds, bull trout redds, live fish, carcasses (salmon) and sex, length, and spawning occurrence information from salmon carcasses.

Frequency: For spring chinook salmon surveys (Lolo Creek): One main spawning survey (two days) after spawning is completed, usually between September 7 and 15. Multiple surveys during spawning period are usually conducted by the Nez Perce Tribal Fisheries Department personnel; district may assist in this effort. For bull trout surveys (Lochsa River and North Fork Clearwater River: One or more surveys will be conducted between August 20 and September 30.

Duration: Indefinite.

Methodology: For spring chinook salmon surveys (Lolo Creek): Salmon spawning

activity will be monitored from August 15 through mid-September to document peak spawning and spawning completion time periods. Two survey days between September 7 and 15 will be scheduled to conduct surveys for all stream reaches. Stream reaches will be walked by two persons, one with spawning survey experience. Salmon redds are counted and located on a map. Live fish and carcasses are counted. Sex, length and evidence of spawning are noted from each carcass whenever possible. For bull trout surveys: Procedures, similar to the salmon surveys will be used.

Data Storage: District and S.O. Fisheries files.

Report: Survey data for Lolo Creek will be summarized with additional information that the Nez Perce Tribal Fisheries Department crews usually collect during several surveys prior to and during the USFS survey dates. A report will be done by the District Biologists and submitted to the Forest Fisheries Biologist at the end of the sampling period. Portions of the reports are selected for inclusion in the *Forest Plan Monitoring Results Report.*

Cost: $3,000 annually.

Personnel Needed: District Fisheries Biologist, Biological Technicians, and Forest Fisheries Biologist. A minimum of two people are needed for each area.

Responsible Individual: District Fisheries Biologist for data collection and initial report. Pat Murphy for report summaries for the Forest Plan Monitoring Results Report.

Sampling Sites: Lolo Creek Drainage:

Stream	District	Species	Single/Multiple[1]	Record
Lolo Creek	Pierce	Spring Chinook Salmon	Multiple	1988-1996
Eldorado Creek	Pierce	Spring Chinook Salmon	Single	1989-1996
Yoosa Creek	Pierce	Spring Chinook Salmon	Multiple	1989-1996

Musselshell Creek	Pierce	Spring Chinook Salmon	Single	1993-1996

[1] Number of times the specific stream reaches are surveyed.

Sampling Sites: Lochsa River Watershed

Stream	District	Species	Single/Multiple[1]	Record
Squaw Creek	Powell	Bull Trout	Multiple	1994-96
Beaver Creek	Powell	Bull Trout	Multiple	1996
Squaw Creek[2]	Powell	Spring Chinook Salmon	Multiple	1992-96
Papoose Creek[2]	Powell	Spring Chinook Salmon	Multiple	1992-96
Crooked Fork Creek[3]	Powell	Spring Chinook Salmon	Multiple	1972-1996
Brushy Fork Creek[3]	Powell	Spring Chinook Salmon	Multiple	1972, 1973-1996

[1] Number of times the specific stream reaches are surveyed.
[2] Surveys conducted by the Nez Perce Tribal Fisheries Department.
[3] Surveys conducted by the Idaho Department of Fish and Game.

Sampling Sites: North Fork Clearwater River

Stream	District	Species	Single/Multiple[1]	Record
Vanderbilt Creek	North Fork	Bull Trout	Single	1995, 1996
Placer Creek	North Fork	Bull Trout	Single	1995, 1996

[1] Number of times the specific stream reaches are surveyed.

Monitoring Project Summary Sheet

Type of Monitoring: Effectiveness

Project Name: Forest-wide Stream Substrate Monitoring

Objectives: To monitor trends in substrate conditions via cobble embeddedness measurements. To monitor spawning gravel conditions via substrate coring. To assess stream conditions (instream sediment) as related to the Forest Plan's Desired Future Conditions.

Parameters: Cobble embeddedness, percentage of fines by depth (substrate coring).

Frequency: For permanent cobble embeddedness monitoring sites: one survey every two years. For substrate coring sites: annually.

Duration: Indefinitely.

Methodology: Procedures for cobble embeddedness measurements are described in Espinosa 1988. Average cobble embeddedness levels were determined by establishing three transects at each habitat type (pool, riffle and run) and measuring embeddedness of 25-50 cobbles per habitat type intersected by the transect line as described in Burns and Edwards (1985). Embeddedness values were weighted according to the procedures described by Torquemada and Platts (1988). Substrate coring procedures follow information in Platts et al. (1983), McNeil (1964) and McNeil and Ahnell (1964) and are documented for summary reports for the Pete King Creek and Deadman Creek monitoring sites.

Data Storage: District fisheries files and S.O. fisheries files.

Report: Summary reports are completed by district personnel and submitted to the Fores Fisheries Biologist. Portions of the reports are selected for inclusion in the *Forest Plan Monitoring Results Report.*

Personnel Needed: District Biologist, Hydrological and Biological Technicians. One or two people needed for cobble embeddedness monitoring. A minimum of five people are needed for substrate coring project on Pete King and Deadman creeks.

Cost: A total of about $ 10,000. About $3,500 annually for permanent monitoring sites within the upper Lochsa River drainage (Powell Ranger District). Additional $2,500 is estimated for additional cobble

embeddedness monitoring projects throughout the Forest. Substrate coring within the lower Lochsa River drainage is estimated at $3,000.

Responsible Individual: District personnel for data collection and completion of summary reports. Pat Murphy for overall summaries for the *Forest Plan Monitoring Results Report..*

Sampling Sites: Lolo Creek Drainage:

Stream	District	Survey Type	# Of Stations	Record
Lolo Creek	Pierce	Cobble Embeddedness	3	1993, 1996
Eldorado Creek	Pierce	Cobble Embeddedness	2	1996

Sampling Sites: Lochsa River Drainage:

Stream	District	Survey Type	# Of Stations	Records
Pete King Creek	Lochsa	Substrate Coring Cobble Embeddedness	25	1982-1996 (coring) 1996
Deadman Creek	Lochsa	Substrate Coring Cobble Embeddedness	Minimum 20	1982-1996 (coring) 1996
Weir Creek	Powell	Cobble Embeddedness	5	1988, 1990, 1992, 1996
Post Office Creek	Powell	Cobble Embeddedness	5	1988, 1990, 1992, 1996
Squaw Creek	Powell	Cobble Embeddedness	5	1988, 1990, 1992, 1996
Papoose Creek	Powell	Cobble Embeddedness	5	1988, 1990, 1992, 1996

Brushy Fork Creek	Powell	Cobble Embeddedness	5	1988, 1990, 1992, 1996

Monitoring Project Summary Sheet

Type of Monitoring: Baseline/Effectiveness

Project Name: Baseline Stream Surveys

Objectives: To collect fish habitat and population data on undeveloped and developed watersheds. To assess stream conditions as related to the Forest Plan's water quality standards and the Desired Future Conditions for each stream. Approximately 358 miles of streams (including over 440 fish population monitoring stations) are scheduled to be surveyed in 1996.

Parameters: Fish habitat, riparian and channel conditions; fish composition, abundance and distribution.

Frequency: All fish bearing or potential fish bearing streams are scheduled to be surveyed using standardized methodology. For developed streams surveys are scheduled every 5-10 years. Streams within undeveloped watersheds are scheduled 10-25 years dependent upon future catastrophic events (ie. fires, floods).

Duration: Indefinitely

Methodology: Standard stream survey techniques (Clearwater National Forest's transect methodology) as outlined in Espinosa (1988) and including revisions from 1989-1995 (Revised Survey Methodology documentation for Columbia River Basin Aquatic Data Request 1995). The majority of the stream surveys are completed via contract.

Data Storage: District files and SO files.

Report: Streams under contract: Report will be prepared by contractor. Field data forms and electronic data will be submitted to the Forest. Surveys conducted by district/forest crews will be summarized and reported.

Personnel Needed: District Biologist and Forest Fisheries Biologist will prepare and administer contracts. District Biologist, biological and hydrological

technicians, and Forest Hydrologist and Forest Fisheries Biologist will conduct surveys on South Fork Kelly Creek in 1996.

Cost: Contract costs usually run from $600-$1,000/mile of stream. Costs for work conducted as part of the baseline stream surveys varies annually dependent upon number and location of streams.

Responsible Individual: District and Forest personnel for contract administration and data collection. Pat Murphy and Gayle Howard for data base maintenance.

Sample Sites: Palouse River Drainage

Stream	District	Miles	# Fish Station	Record[1]
Gold Creek	Palouse	2.1	5	Initial
Picnic Gulch	Palouse	0.7	2	Initial
EF Gold Crk	Palouse	1.1	3	Initial
Treasure Gulch	Palouse	1.1	3	Initial
Total		5.3	13	

[1] Initial - First intensive survey conducted on stream; Revised Baseline - Subsequent survey updating a previous stream survey that used a different methodology; Update - Additional survey conducted to update conditions using similar methodology as previous survey.

Sample Sites: North Fork Clearwater River Drainage

Stream	District	Miles	# Fish Station	Record[1]
Elk Creek (mouth)	Palouse	20.8	30	Initial
West Fork Elk Creek	Palouse	3.7	5	Initial

Unnamed Trib Elk Creek (UBB)	Palouse	0.9	2	Initial
Unnamed Trib Elk Creek (UBR)	Palouse	0.9	2	Initial
Shite Creek	Palouse	1.7	3	Initial
Morris Creek	Palouse	0.7	2	Initial
Unnamed Trib Elk Creek (HAN)	Palouse	1.2	2	Initial
Deer Creek	Palouse	1.0	3	Initial
Deep Creek	Palouse	1.2	3	Initial
Spud Creek	Palouse	0.3	2	Initial
Bull Run Creek	Palouse	3.1	5	Initial
Lindley Creek	Palouse	1.9	3	Initial
WF Lindley	Palouse	1.2	2	Initial
Cloverleaf Creek	Palouse	3.0	5	Initial
Star Creek	North Fork	.9	3	Initial
Grasshopper Creek	North Fork	1.6	5	Initial
Lost Pete Creek	North Fork	4.2	5	Initial
Unnamed Trib (LPA)	North Fork	0.9	2	Initial
Lower Twin Creek	North Fork	4.2	5	Initial
Upper Twin Creek	North Fork	2.0	3	Initial

Unnamed Long Creek Tributary (LGB)	North Fork	1.4	3	Initial
Unnamed Tributary (Birch Mountain-BHT)	North Fork	1.7	3	Initial
Pete Ott Creek	North Fork	4.8	5	Initial
Ring Lake Tributary (POU)	North Fork	0.8	2	Initial
Tributary A (POV)	North Fork	1.1	2	Initial
Flat Mtn Tributary (POW)	North Fork	0.9	2	Initial
Elizabeth Mtn Tributary (POX)	North Fork	1.3	2	Initial
Elizabeth Creek	North Fork	6.6	10	Initial
Cold Lake Tributary	North Fork	0.5	2	Initial
Eillie Lake Tributary (ELB)	North Fork	1.7	3	Initial
Elizabeth Lake Tributary (ELC)	North Fork	2.1	3	Initial
Unnamed Tributary (ELD)	North Fork	0.7	2	Initial
Unnamed Tributary (ELE)	North Fork	0.4	2	Initial
Fix Creek	North Fork	2.6	5	Initial

Unnamed Tributary (FXI)	North Fork	0.4	2	Initial
South Fork Kelly Creek	North Fork	4.6	15	Initial
Williams Creek	North Fork	2.1	5	Initial
Total		89.1	160	

[1] Initial - First intensive survey conducted on stream; Revised Baseline - Subsequent survey updating a previous stream survey that used a different methodology; Update - Additional survey conducted to update conditions using similar methodology as previous survey.

Sampling Sites: Lochsa River Drainage:

Stream	District	Miles	# Fish Station	Record
East Fork Split Creek	Lochsa	6.4	5	Initial
Old Man Creek	Lochsa	33	25	Revised Baseline
Chimney Creek	Lochsa	3.1	5	Initial
Big Stew Creek	Lochsa	4.2	5	Initial
Huckleberry Creek	Lochsa	3.4	3	Initial
Grit Creek	Lochsa	2.5	3	Initial
Rock Lake Creek	Lochsa	3.8	5	Initial
Lone Knob Creek	Lochsa	1.2	2	Initial
Pass Creek	Lochsa	2.7	3	Initial

Hard Creek	Lochsa	2.7	3	Revised Baseline
Noseeum Creek	Lochsa	2.6	4	Revised Baseline
Castle Creek	Lochsa	1.9	4	Revised Baseline
Holly Creek	Lochsa	5.7	6	Revised Baseline
Skookum Creek	Lochsa	2.2	4	Revised Baseline
Tick Creek	Lochsa	2.1	4	Initial
Tom Cat Creek	Lochsa	1.8	4	Initial
Unnamed Tributary to Tom Cat Creek (TOA)	Lochsa	0.5	2	Initial
Macaroni Creek	Lochsa	2.0	4	Initial
Snowshoe Creek	Lochsa	1.3	3	Initial
East Fork Deadman Creek	Lochsa	2.9	5	Initial
Unnamed Tributary EF Deadman Creek (EDA)	Lochsa	0.5	2	Initial
Unnamed Tributary - Deadman Creek(DMA)	Lochsa	2.5	4	Initial

Unnamed Tributary Deadman Creek(DMB)	Lochsa	0.4	2	Initial
Middle Fork Deadman Creek	Lochsa	4.4	6	Revised Baseline
Unnamed Tributary - Middle Fork Deadman Creek(DMC)	Lochsa	1.8	4	Initial
Unnamed Tributary - Middle Fork Deadman Creek(DMD)	Lochsa	0.3	1	Initial
Unnamed Tributary - Middle Fork Deadman Creek(DME)	Lochsa	0.2	1	Initial
Unnamed Tributary - Middle Fork Deadman Creek(DMF)	Lochsa	0.3	1	Initial
Unnamed Tributary - Middle Fork Deadman Creek(DMH)	Lochsa	0.9	2	Initial
Unnamed Tributary - Middle Fork Deadman Creek(DMI)	Lochsa	0.9	2	Initial

West Fork Deadman Creek	Lochsa	1.1	3	Revised Baseline
Unnamed Tributary - West Fork Deadman Creek(WDA)	Lochsa	1.5	2	Initial
Unnamed Tributary - West Fork Deadman Creek(WDB)	Lochsa	2.0	4	Initial
Unnamed Tributary - West Fork Deadman Creek(WDC)	Lochsa	0.4	1	Initial
Eagle Mountain Creek	Powell	8.3	7	Initial
Indian Meadows Creek	Powell	9.0	6	Initial
Mocus Creek	Powell	5.3	3	Initial
Mocus Point Creek	Powell	5.4	4	Initial
Bear Mountain Creek	Powell	5.5	3	Initial
Colgate Creek	Powell	2.6	2	Initial
Eagle Creek	Powell	4.6	3	Initial
Robin Creek	Powell	7.5	6	Initial
Jay Creek	Powell	6.8	5	Initial

Unnamed Lochsa Face Tributary(LRB)	Powell	1.3	2	Initial
Unnamed Lochsa Face Tributary(LRC)	Powell	1.7	2	Initial
Unnamed Lochsa Face Tributary(LRD)	Powell	1.5	2	Initial
Unnamed Lochsa Face Tributary(LRE)	Powell	1.7	2	Initial
Unnamed Lochsa Face(LRG) Tributary	Powell	1.5	2	Initial
Unnamed Lochsa Face Tributary(LRH)	Powell	1.6	2	Initial
Unnamed Lochsa Face Tributary(LRI)	Powell	2.2	2	Initial
Unnamed Lochsa Face Tributary(LRJ)	Powell	2.4	2	Initial
Unnamed Lochsa Face Tributary(LRK)	Powell	1.5	2	Initial
Unnamed Lochsa Face Tributary(LRA)	Powell	3.6	3	Initial
Ashpile Creek	Powell	1.4	2	Initial
Ginger Creek	Powell	1.5	2	Initial

Unnamed Lochsa Face Tributary(LRF)	Powell	4.6	4	Initial
Burnt Cedar Creek	Powell	1.0	2	Initial
Cold Storage Creek	Powell	1.2	2	Initial
Unnamed Lochsa Face Tributary(LRL)	Powell	2.0	2	Initial
Powell Creek	Powell	1.1	3	Initial
Boulder Creek	Powell	29.3	25	Revised Baseline
Fox Creek	Powell	5.2	5	Revised Baseline
Shotgun Creek	Powell	10.1	5	Revised Baseline
Rock Creek	Powell	5.2	3	Initial
Haskell Creek	Powell	4.6	5	Revised Baseline
Hopeful Creek	Powell	19.6	17	Revised Baseline
Total		264.0	271	

[1] Initial - First intensive survey conducted on stream; Revised Baseline - Subsequent survey updating a previous stream survey that used a different methodology; Update - Additional survey conducted to update conditions using similar methodology as previous survey.

Monitoring Project Summary Sheet

Type of Monitoring: Baseline/Effectiveness

Project Name: Habitat and Biological Assessments

Objectives: Determine baseline conditions for a minimally disturbed Palouse Region stream (White Pine Creek) and monitor the effects of timber harvest, road construction, and livestock grazing on physical habitat and biological communities.

Parameters: Macroinvertebrate Communities, Substrate Characterization, Cobble Embeddedness, Depth and Velocity, Pool/Riffle Ratio, Channel Alteration, Bank Stability, Bank Vegetation, Canopy Cover, Riparian Width, and Photo Points.

Frequency: Every Spring (May) and Fall (October) to capture the full range of flows and biological communities.

Duration: White Pine- Before, during and up to three years after timber harvest activities. If effects are noted monitoring will continue until recovery is noted.
Schwartz Creek- Until monitoring determines a recovery to pre-harvest levels.
Once these conditions are met, both stations will be placed on a 3-5 year cycle.

Methodology: Five samples were collected from five consecutive riffles using a modified Hess sampler. The thalweg was sampled to ensure that water was present during low flow conditions and to reduce variability. When abundant at the site, a coarse particulate sample was collected. At each Hess sample location the habitat data was collected. These variables were rated in accordance with the EPA Rapid Bioassessment protocols (Plafkin, et.al 1989). The samples were sorted and identified by either an aquatic ecologist or University of Idaho taxonomist. This data was then entered into 29 metrics. Twenty of these metrics were used, along with physical habitat characteristics, to determine the overall health of the benthic Macroinvertebrate community

Data Storage: S.O. and Palouse District Fisheries files.

Report: A report will be completed by the contractor following the fall sample.

This report will present all current data and metrics, as well as comparisons to previous years. A summary of this report will be included in the Annual Palouse Aquatic monitoring report and may be included in the Forest Plan Monitoring Result.

Cost: $1600 annually for two stations/twice a year and a report.

Personnel Needed: District Hydrologist to administer contract.

Responsible Individual: Michael Philbin, district hydrologist, to administer contract.

Sampling Sites: Palouse River Drainage

Stream	District	Beneficial Use[1]	Record	Activity
White Pine Creek	Palouse	Brook Trout Low Fish	1994-1996	Baseline, Timber Sale

Sampling Sites: Potlatch River Drainage

Stream	District	Beneficial Use[1]	Record	Activity
Schwartz Creek	Palouse	Rainbow Trout Minimum Viable	1991-1996	Timber Sale, Grazing, Roading

Monitoring Project Summary Sheet

Type of Monitoring: Baseline

Project Name: High Mountain Lake Surveys

Objectives: As part of a agreement with the Idaho Department of Fish and Game(IDFG) and Lewis Clark State College (LCSC), the Forest has funded an high mountain lake survey since 1994 to acquire necessary baseline ecological data. The purpose of the agreement is to cooperatively fund field surveys, collection and analysis of data, and preparation of final reports for selected high mountain lakes. In 1994 and 1995, the project surveyed 13 and 43 high mountain lakes respectively. The main objective for 1995-96 field seasons is to complete the surveys for all lakes within designated Selway-Bitterroot Wilderness Area. Information on current salmonid production (natural reproduction) acquired through these surveys will assist IDFG and USFS in the current wilderness lake fish stocking issue.

Parameters: Fish composition, enumeration by species and size (age class), fish data reported for each habitat type and per 100 square meters. Selected habitat and visitor use information.

Frequency: One baseline survey. Baseline information will be collected during the field season of July 5 through October 1, 1996.

Duration: Follow-up survey on fish population information by USFS personnel.

Methodology: Methodology will follow the mountain lake survey work conducted by Bahls (1992). The survey intensity may vary among lakes; complete surveys will be conducted on all fish bearing lakes while cursory surveys may be completed on shallow non-fish bearing lakes. While physical information will be collected on shallow lakes, biological information (ie. macroinvertebrates) will be collected on a portion of the lakes.

Data Storage: Field data on IDFG PC files; Copies of final reports at SO and appropriate district offices.

Report: A report will be completed by IDFG personnel and LCSC students and submitted to the USFS by March 1, 1997. Portions of the reports are selected for inclusion in the *Forest Plan Monitoring Results Report.*

Cost: and $37,000 annually: $15,300 USFS contributions and $21,700 for IDFG LCSC contributions.

Personnel Needed: USFS coordination will be completed by Pat Murphy. IDFG provides permanent and seasonal personnel. LCSC provides seasonal and volunteer personnel.

Responsible Individual: USFS coordination - Pat Murphy . Overall project leader: Tim Cochnauer, Regional Fisheries Manager, Region 2, IDFG - Lewiston, Idaho.

Sampling Sites for 1996 High Mountain Lake Surveys:

LAKE NAME	LEGAL	QUAD	IDFG#	ACRES
Ranger Lake	37N16E S26	Ranger Peak	0275	7.1
NE Ranger Lake	37N16E S26	Ranger Peak		1.4
NE Beaver	37N 16E S10	Ranger Peak	0326	.8
North Beaver	37N 16E S10	Ranger Peak		.7
Little N Beaver	37N 16E S10	Ranger Peak		1.0
Siah Lake	37N 16E S28/27	Ranger Peak	0274	11.9
Section 27	37N 16E S27	Ranger Peak		.5
N Shoot Creek #1	37N 16E S33/4	Ranger Peak	0325	3.2
E Shoot Creek #2	37N 16E S3	Ranger Peak		.6
S Shoot Creek #3	37N 16E S3/4	Ranger Peak		.5
S Spruce Creek #1	37N 16E S12	Ranger Peak	0330	9.5
N Spruce Creek #2	37N 16E S1	Ranger Peak	0329	3.2
S Section 25	37N 16E S25	Ranger Peak		.5
N Section 25	37N 16E S25	Ranger Peak		.7
Old Stormy	37N17E S31	Ranger Peak	0280	4.3
L NW Grimes	37N 17E S7	Ranger Peak	0332	2.3
U NW Grimes	37N 17E S6	Ranger Peak		.5
N Rudd-Moore	38N 16E S28/29	Ranger Peak	0321	4.0
U SE Grimes	37N 17E S7	St. Joseph Peak		.8
L SE Grimes	37N 17E S7	St. Joseph Peak		.5
Storm Lake	37N 17E S7/18	St. Joseph Peak	0276	15.1
N SF Storm Lake	37N 17E S17	St. Joseph Peak	0279	2.0
Middle	37N 17E S20	St. Joseph Peak	0277	3.3
S SF Storm	37N 17E S29	St. Joseph Peak		.7

Moose	38N 17E S29/30	St. Joseph Peak	0333	17.7
Lower North Wind Lake	35N 14E S7	Grave Peak		1.4
Upper North Wind Lake	35N 14E S7	Grave Peak		4.3
HooDoo Pond	34N 14E S1	Cedar Ridge		.4
Friday Ridge	35N 14E S20	Cedar Ridge	0440	1.4
East Muleshoe	35N 15E S30	Cedar Ridge		.5
East Pond	35N 15E S30	Cedar Ridge		.5
Maple	36N 14E S18/19	Cedar Ridge		.4
Greystone MDW	35N11E S9	Greystone Butte		4.7
W Brushy Creek #1	38N 17E S21/20	Dick Creek	0339	4.3
S Brushy Creek #2	38N 17E S21	Dick Creek		3.1
M Brushy Creek #3	38N 17E S16/21	Dick Creek		1.3
N Brushy Creek #4	38N 17E S16	Dick Creek		1.8
S Hidden Creek	35N 16E S22	Blodgett Mtn		.5
N Hidden Creek	35N 16E S22	Blodgett Mtn		1.9
No Name (Big Flat)	35N 16E S34	Blodgett Mtn		2.8
Poacher Creek	34N 16E S17/20	Blodgett Mtn		1.9
Shattuck	34N 16E S16	Blodgett Mtn		1.4
Heslip	35N 11E S26	Fish Lake		4.7
Kooskooskia	35N 14E S15	Grave Peak		5.7
Meadow Pond	35N 14E S11/14	Grave Peak		4.3
Marion Meadows	36N 14E S26	Grave Peak	0281	2.1
Marsh 1-6	34N 15E S3	Jeanette Mtn	6lakes	4.4
Stalk Pond	35N 15E S21	Jeanette Mtn		.4
Jeanette Mtn	34N 15E S14	Jeanette Mtn		6.2
Savage Ridge	36N 15E S8/17	Savage Ridge	0268	3.3
Dodge	35N 13E S20	Hungry Rock	0259	2.8

Lookout	36N 16E S9	White Sand Lake	1.9
Pothole	36N 16E S21	White Sand Lake	.2
		TOTAL	161.4